

SEQUENCE LISTING

<110> E. I. DU PONT DE NEMOURS AND COMPANY

<120> PLANT 1-DEOXY-D-XYLULOSE 5-PHOSPHATE REDUCTOISOMERASE

<130> BB1297

<140>

<141>

<150> 60/110,865

<151> 1998-DECEMBER-04

<160> 22

<170> Microsoft Office 97

<210> 1

<211> 565

<212> DNA

<213> Zea mays

<220>

<221> unsure

<222> (5) .. (9)

<220>

<221> unsure

<222> (450)

<220>

<221> unsure

<222> (549)

<400> 1

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| gcctacccta | ctacactcgt | gccgattcgg | cacgagcagc | gacggtcgcc | accaccgctc | 120 |
| ccctccctct | ccccctcctc | gccagcggc | aattaccaca | gcctccccag | caagccggga | 180 |
| tggtgcact | caaggcatcg | ttccgggggtg | agctcagcgc | cgcttccttc | ctcgactcca | 240 |
| gcaggggacc | tctcgtccag | cacaaagtgg | attttacgtt | tcaaaggaag | ggcaaacgag | 300 |
| ctatttcact | gagaaggaca | tgctgttcta | tgcaacaggc | tccaccacca | gcattggcctg | 360 |
| ggcgagctgt | tgctgagcct | ggccggagtc | atgggatggc | ccaaagccta | tctcgattgt | 420 |
| tggttcaact | ggttccatag | gaacacagan | attggacatt | gttgccggaga | atcctgataa | 480 |
| gttcagagtt | gttgctcttg | ctgctggatc | caatgtcacg | cttctagctg | atcaggtcaa | 540 |
| aacattcana | cctaagttgg | ttcgg | | | | 565 |

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<211> 63

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<213> Zea mays

<220>

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<222> (58)

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Pro Asp Lys Phe Arg Val Val Ala Leu Ala Ala Gly Ser Asn Val Thr
35 40 45
Leu Leu Ala Asp Gln Val Lys Thr Phe Xaa Pro Lys Leu Val Arg
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<212> DNA
<213> Zea mays

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<220>
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ggttgtgagc ggctgaagcc tacagttgct gcaattgaag ctggtaaaga catagcattg 180
gcaaacaaag agacacttat tgcaggtggc ccttttgtgc ttccccttgc acacaaacac 240
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cagtctatca tacactctat ggttgaaacc caggattcat ctgtcctagc tcagttggga 600
tggccagata tgcggttacc aatcttatac accttatcat ggccagatag gagtccctgag 660
cgctgctaag gagaaggccg tggagttggt cattgacgag aagattagct acctggacat 720
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<211> 217
<212> PRT
<213> Zea mays

<220>
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<220>
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35 40 45
Val Ala Ala Ile Glu Ala Gly Lys Asp Ile Ala Leu Ala Asn Lys Glu
50 55 60
Thr Leu Ile Ala Gly Gly Pro Phe Val Leu Pro Leu Ala His Lys His
65 70 75 80
Lys Val Lys Ile Leu Pro Ala Asp Ser Glu His Ser Ala Ile Phe Gln
85 90 95
Cys Ile Gln Gly Leu Ser Glu Gly Ala Leu Arg Arg Ile Ile Leu Thr
100 105 110
Ala Ser Xaa Gly Ala Phe Xaa Asp Trp Pro Xaa Asp Arg Leu Lys Asp
115 120 125
Val Lys Val Ala Asp Ala Leu Lys His Pro Asn Trp Asn Met Gly Arg
130 135 140
Lys Ile Thr Val Asp Ser Ala Thr Leu Phe Asn Lys Gly Leu Glu Val
145 150 155 160
Ile Glu Ala His Tyr Leu Phe Gly Ala Glu Tyr Asp Asp Ile Glu Ile
165 170 175
Val Ile His Pro Gln Ser Ile Ile His Ser Met Val Glu Thr Gln Asp
180 185 190
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195 200 205
Leu Tyr Thr Leu Ser Trp Pro Asp Arg
210 215

<210> 5
<211> 1901
<212> DNA
<213> Oryza sativa

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cggcacgagg tttaaaccag acgtcgagtc gagcattaac tcagtcaggg tggccatggc 180
gctcaaggtc gtctctttcc ccggggactt ggccgcggtc tcattcctcg actccaacag 240
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aacattcaaa ccaaagcttg ttgctgtaag aattattcct ttagttgatg agctaaagga 600
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gataccaacc ttatacacca tgtcttggcc agacagaatc tattgctcag aggtcacctg 1260
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<210> 6
<211> 473
<212> PRT
<213> Oryza sativa

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Phe Leu Asp Ser Asn Arg Gly Gly Ala Phe Asn Gln Leu Lys Val Asp
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Leu Pro Phe Gln Thr Arg Asp Arg Arg Ala Val Ser Leu Arg Arg Thr
    35                      40                      45

Cys Cys Ser Met Gln Gln Ala Pro Pro Pro Ala Trp Pro Gly Arg Ala
    50                      55                      60

Val Val Glu Pro Gly Arg Arg Ser Trp Asp Gly Pro Lys Pro Ile Ser
    65                      70                      75                      80

Ile Val Gly Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu Asp Ile Val
    85                      90                      95

Ala Glu Asn Pro Asp Lys Phe Arg Val Val Ala Leu Ala Ala Gly Ser
    100                      105                      110

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| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Val | Thr | Leu | Leu | Ala | Asp | Gln | Val | Lys | Thr | Phe | Lys | Pro | Lys | Leu | 115 | 120 | 125 |
| Val | Ala | Val | Arg | Asn | Glu | Ser | Leu | Val | Asp | Glu | Leu | Lys | Glu | Ala | Leu | 130 | 135 | 140 |
| Ala | Asp | Cys | Asp | Trp | Lys | Pro | Glu | Ile | Ile | Pro | Gly | Glu | Gln | Gly | Val | 145 | 150 | 155 |
| Ile | Glu | Val | Ala | Arg | His | Pro | Asp | Ala | Val | Thr | Val | Val | Thr | Gly | Ile | 165 | 170 | 175 |
| Val | Gly | Cys | Ala | Gly | Leu | Lys | Pro | Thr | Val | Ala | Ala | Ile | Glu | Ala | Gly | 180 | 185 | 190 |
| Lys | Asp | Ile | Ala | Leu | Ala | Asn | Lys | Glu | Thr | Leu | Ile | Ala | Gly | Gly | Pro | 195 | 200 | 205 |
| Phe | Val | Leu | Pro | Leu | Ala | Gln | Lys | His | Lys | Val | Lys | Ile | Leu | Pro | Ala | 210 | 215 | 220 |
| Asp | Ser | Glu | His | Ser | Ala | Ile | Phe | Gln | Cys | Ile | Gln | Gly | Leu | Pro | Glu | 225 | 230 | 235 |
| Gly | Ala | Leu | Arg | Arg | Ile | Ile | Leu | Thr | Ala | Ser | Gly | Gly | Ala | Phe | Arg | 245 | 250 | 255 |
| Asp | Trp | Pro | Val | Asp | Lys | Leu | Lys | Glu | Val | Lys | Val | Ala | Asp | Ala | Leu | 260 | 265 | 270 |
| Lys | His | Pro | Asn | Trp | Asn | Met | Gly | Lys | Lys | Ile | Thr | Val | Asp | Ser | Ala | 275 | 280 | 285 |
| Thr | Leu | Phe | Asn | Lys | Gly | Leu | Glu | Val | Ile | Glu | Ala | His | Tyr | Leu | Phe | 290 | 295 | 300 |
| Gly | Ala | Glu | Tyr | Asp | Asp | Ile | Glu | Ile | Val | Ile | His | Pro | Gln | Ser | Ile | 305 | 310 | 315 |
| Ile | His | Ser | Met | Ile | Glu | Thr | Gln | Asp | Ser | Ser | Val | Leu | Ala | Gln | Leu | 325 | 330 | 335 |
| Gly | Trp | Pro | Asp | Met | Arg | Ile | Pro | Thr | Leu | Tyr | Thr | Met | Ser | Trp | Pro | 340 | 345 | 350 |
| Asp | Arg | Ile | Tyr | Cys | Ser | Glu | Val | Thr | Trp | Pro | Arg | Leu | Asp | Leu | Cys | 355 | 360 | 365 |
| Lys | Leu | Gly | Ser | Leu | Thr | Phe | Lys | Ala | Pro | Asp | Asn | Val | Lys | Tyr | Pro | 370 | 375 | 380 |
| Ser | Met | Asp | Leu | Ala | Tyr | Ala | Ala | Gly | Arg | Ala | Gly | Gly | Thr | Met | Thr | 385 | 390 | 395 |
| Gly | Val | Leu | Ser | Ala | Ala | Asn | Glu | Lys | Ala | Val | Glu | Leu | Phe | Ile | Asp | 405 | 410 | 415 |
| Glu | Lys | Ile | Gly | Tyr | Leu | Asp | Ile | Phe | Lys | Val | Val | Glu | Leu | Thr | Cys | 420 | 425 | 430 |

Asp Ala His Arg Asn Glu Leu Val Thr Arg Pro Ser Leu Glu Glu Ile
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Ile His Tyr Asp Leu Trp Ala Arg Glu Tyr Ala Ala Ser Leu Gln Pro
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Ser Thr Gly Leu Ser Pro Val Pro Val
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<210> 7
 <211> 1592
 <212> DNA
 <213> Glycine max

<220>
 <221> unsure
 <222> (993)

<220>
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 <222> (1402)

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 agtgacacaa cagtagagag acgagtttat tgctctgccg ctgctcaatc accaccacca 180
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 gagttcccaa aaagatttaa agttgtgagc cttgctgctg gctctaatat tactcttctt 360
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 aacataaaaa ttcttcccgc tgattcggaa cattctgcaa tttttcagtc tatccagggg 720
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 <213> Glycine max

<220>
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 <222> (325)

<220>

<221> UNSURE

<222> (462)

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| Ser | Ser | Asn | Asn | Ser | Thr | Lys | Leu | Pro | Gly | Ser | Phe | Ser | Leu | Lys | Arg |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Lys | Asp | Ser | Asp | Thr | Thr | Val | Glu | Arg | Arg | Val | Tyr | Cys | Ser | Ala | Ala |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Ala | Gln | Ser | Pro | Pro | Pro | Ala | Trp | Pro | Gly | Thr | Ala | Ile | Pro | Glu | Pro |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Ser | Asp | Phe | Lys | Thr | Trp | Asp | Gly | Gln | Lys | Pro | Ile | Ser | Val | Leu | Gly |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 |
| Ser | Thr | Gly | Ser | Ile | Gly | Thr | Gln | Thr | Leu | Ser | Ile | Val | Ala | Glu | Phe |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Pro | Glu | Arg | Phe | Lys | Val | Val | Ser | Leu | Ala | Ala | Gly | Ser | Asn | Ile | Thr |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Leu | Leu | Ala | Asp | Gln | Ile | Lys | Thr | Phe | Lys | Pro | Glu | Val | Val | Gly | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Arg | Asn | Glu | Ser | Leu | Ile | Asp | Glu | Leu | Lys | Glu | Ala | Leu | Ala | Asp | Val |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Asp | His | Lys | Pro | Glu | Ile | Ile | Pro | Gly | Glu | Gln | Gly | Val | Ile | Glu | Ala |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |
| Ala | Arg | His | Pro | Asp | Ala | Thr | Thr | Val | Val | Thr | Gly | Ile | Val | Gly | Cys |
| | | | | 165 | | | | | 170 | | | | | 175 | |
| Ala | Gly | Leu | Lys | Pro | Thr | Val | Ala | Ala | Ile | Glu | Ala | Gly | Lys | Asp | Ile |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Ala | Leu | Ala | Asn | Lys | Glu | Thr | Met | Ile | Ala | Gly | Ala | Pro | Phe | Val | Leu |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Pro | Leu | Ala | His | Lys | His | Asn | Ile | Lys | Ile | Leu | Pro | Ala | Asp | Ser | Glu |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| His | Ser | Ala | Ile | Phe | Gln | Ser | Ile | Gln | Gly | Leu | Pro | Lys | Gly | Ala | Leu |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 |
| Arg | Lys | Ile | Leu | Leu | Thr | Gly | Ser | Gly | Gly | Ala | Phe | Arg | Glu | Trp | Pro |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Ala | Glu | Lys | Met | Lys | Asp | Ile | Lys | Leu | Ala | Asp | Ala | Leu | Lys | His | Pro |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| Ile | Trp | Ser | Leu | Gly | Arg | Lys | Ile | Thr | Ile | Asp | Ser | Ala | Thr | Leu | Phe |
| | | 275 | | | | | 280 | | | | | 285 | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Asn | Lys | Gly | Leu | Glu | Val | Ile | Glu | Ala | His | Tyr | Leu | Phe | Gly | Ala | Ser | |
| 290 | | | | | | 295 | | | | | 300 | | | | | |
| Tyr | Asp | Asp | Ile | Glu | Ile | Val | Ile | His | Pro | Gln | Ser | Ile | Ile | His | Ser | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | |
| Leu | Val | Glu | Thr | Xaa | Asp | Ser | Ser | Val | Asn | Ala | Gln | Leu | Gly | Ile | Pro | |
| | | | | 325 | | | | | 330 | | | | | 335 | | |
| Asp | Met | Arg | Leu | Pro | Leu | Leu | Tyr | Thr | Leu | Ser | Trp | Pro | Glu | Arg | Ile | |
| | | | 340 | | | | | 345 | | | | | 350 | | | |
| Tyr | Cys | Ser | Glu | Val | Thr | Trp | Pro | Arg | Leu | Asp | Leu | Ser | Lys | Tyr | Gly | |
| | | 355 | | | | | 360 | | | | | 365 | | | | |
| Ser | Leu | Thr | Phe | Tyr | Ala | Pro | Asp | Asp | Lys | Lys | Phe | Pro | Ser | Val | Asn | |
| | 370 | | | | | 375 | | | | | 380 | | | | | |
| Leu | Cys | Tyr | Ala | Ala | Gly | Arg | Ala | Gly | Gly | Thr | Met | Thr | Gly | Val | Leu | |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 | |
| Ser | Ala | Ala | Asn | Glu | Lys | Ala | Val | Glu | Met | Phe | Val | Glu | Glu | Lys | Ile | |
| | | | | 405 | | | | 410 | | | | | | 415 | | |
| Ser | Tyr | Leu | Asp | Ile | Phe | Lys | Val | Val | Glu | Leu | Thr | Cys | Gln | Glu | His | |
| | | | 420 | | | | | 425 | | | | | 430 | | | |
| Gln | Lys | Glu | Leu | Val | Ala | Ser | Pro | Ser | Leu | Glu | Glu | Ile | Ile | His | Tyr | |
| | | 435 | | | | | 440 | | | | | 445 | | | | |
| Asp | Gln | Trp | Ala | Arg | Gln | Tyr | Ala | Ala | Ser | Leu | Gln | Lys | Xaa | Phe | Lys | |
| | 450 | | | | | 455 | | | | | 460 | | | | | |
| Cys | Leu | Asn | Pro | Ile | Phe | Leu | Thr | Tyr | Phe | Arg | Ser | Trp | Gly | Cys | Gly | |
| 465 | | | | | 470 | | | | | 475 | | | | | 480 | |
| Gly | Leu | Leu | Ala | Thr | Ala | Ser | Ile | Phe | Cys | Lys | Cys | Ile | Val | Gly | Ser | |
| | | | | 485 | | | | | 490 | | | | | 495 | | |

Ser Ile Leu

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 <213> Glycine max

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 cgtcacccag atgcagttag tgtagtcaca ggaatagtag gctgtgcagg actgaagcca 420
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35 40 45
Leu Asp Ile Val Ala Glu Asn Pro Asp Lys Phe Lys Val Val Ala Leu
50 55 60
Ala Ala Gly Ser Asn Val Thr Leu Leu Ala Asp Gln Val Lys Arg Phe
65 70 75 80
Lys Pro Gln Leu Val Ala Val Arg Asn Glu Ser Leu Ile Ala Glu Leu
85 90 95
Glu Glu Ala Leu His Asp Val Glu Glu Lys Pro Glu Ile Ile Pro Gly
100 105 110
Glu Gln Gly Ile Ile Glu Val Ala Arg His Pro Asp Ala Val Ser Val
115 120 125
Val Thr Gly Ile Val Gly Cys Ala Gly Leu Lys Pro Thr Val Ala Ala
130 135 140
Ile Glu Ala Gly Lys Asp Ile Ala Leu Ala Asn Lys Glu Thr Leu Ile
145 150 155 160
Ala Gly Gly Pro Leu Ser Pro Leu Ala Gln Lys His Asn Val Lys Ile
165 170 175
Leu Pro Ala Asp Ser Asp Xaa Ser Ala Ile Phe Gln Cys Ile Gln Gly
180 185 190
Leu Pro Glu Gly Ala Leu Arg Arg Val Ile Leu Thr Ala Ser Gly Gly
195 200 205
Ala Phe Arg Gly Trp Pro Val
210 215

<210> 11
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<212> DNA
<213> Triticum aestivum

<220>
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ccgggttggt gcccttgctg ctgggtccaa cgtaactcct ctagctgata aggtgaaaac 360
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<213> Triticum aestivum

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35 40 45
Leu Thr Ser Ser Arg Val Val Ala Leu Ala Ala Gly Ser Asn Val Thr
50 55 60
Pro Leu Ala Asp Lys Val Lys Thr Phe Lys Pro Asn Trp Val Val Leu
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Arg Asn Asp Pro Leu Leu Asn Glu Leu Lys Glu Ala Leu Thr
85 90

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<213> Triticum aestivum

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gtacgcggca gggcgagccg ggggcacat gacgggattt ttgagtgtg ctaatgagaa 240
ggcgtggagc ttgttcacg acgaaaagat taactacctt ggacatcttc aaggngggng 300
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<213> Triticum aestivum

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 35 40 45
 Asp Asn Val Lys Tyr Pro Ser Val Asp Leu Xaa Xaa Tyr Ala Ala Gly
 50 55 60
 Arg Ala Gly Gly Thr Met Thr Gly Phe Leu Ser Ala Ala Asn Glu Lys
 65 70 75 80
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 85 90

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atTTTTTaaa aaggTTTTTT tacctctgca aaaaaaaaaa aaaaaaaa 1847
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His Pro Asn Trp Asn Met Gly Arg Lys Ile Thr Val Asp Ser Ala Thr
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 Leu Phe Asn Lys Gly Leu Glu Val Ile Glu Ala His Tyr Leu Phe Gly
 290 295 300
 Ala Glu Tyr Asp Asp Ile Glu Ile Val Ile His Pro Gln Ser Ile Ile
 305 310 315 320
 His Ser Met Val Glu Thr Gln Asp Ser Ser Val Leu Ala Gln Leu Gly
 325 330 335
 Trp Pro Asp Met Arg Leu Pro Ile Leu Tyr Thr Leu Ser Trp Pro Asp
 340 345 350
 Arg Ile Tyr Cys Ser Glu Val Thr Trp Pro Arg Leu Asp Leu Cys Lys
 355 360 365
 Leu Gly Ser Leu Thr Phe Arg Ala Pro Asp Asn Val Lys Tyr Pro Ser
 370 375 380
 Met Asp Leu Ala Tyr Ala Ala Gly Arg Ala Gly Gly Thr Met Thr Gly
 385 390 395 400
 Val Leu Ser Ala Ala Asn Glu Lys Ala Val Glu Leu Phe Ile Asp Glu
 405 410 415
 Lys Ile Ser Tyr Leu Asp Ile Phe Lys Val Val Glu Leu Thr Cys Asn
 420 425 430
 Ala His Arg Asn Glu Leu Val Thr Ser Pro Ser Leu Glu Glu Ile Val
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 His Tyr Asp Leu Trp Ala Arg Arg Tyr Ala Ala Ser Leu Gln Pro Ser
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 <211> 2019
 <212> DNA
 <213> Glycine max

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<211> 475
<212> PRT
<213> Glycine max

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 20          25          30

Gly Phe Ala Phe Lys Arg Lys Glu Arg Arg Ala Ala Ser Gly Gly Arg
 35          40          45

Val Tyr Cys Ser Val Gln Ala Thr Pro Pro Pro Pro Ala Trp Pro Gly
 50          55          60

Arg Ala Val Pro Glu Gln Gly Arg Lys Thr Trp Asp Gly Pro Lys Pro
 65          70          75          80

Ile Ser Ile Val Gly Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu Asp
 85          90          95

Ile Val Ala Glu Asn Pro Asp Lys Phe Lys Val Val Ala Leu Ala Ala
100          105          110

Gly Ser Asn Val Thr Leu Leu Ala Asp Gln Val Lys Arg Phe Lys Pro
115          120          125

Gln Leu Val Ala Val Arg Asn Glu Ser Leu Ile Ala Glu Leu Glu Glu
130          135          140

Ala Leu His Asp Val Glu Glu Lys Pro Glu Ile Ile Pro Gly Glu Gln
145          150          155          160

Gly Ile Ile Glu Val Ala Arg His Pro Asp Ala Val Ser Val Val Thr
165          170          175

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| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Gly | Ile | Val | Gly | Cys | Ala | Gly | Leu | Lys | Pro | Thr | Val | Ala | Ala | Ile | Glu | |
| | | | 180 | | | | | 185 | | | | | 190 | | | |
| Ala | Gly | Lys | Asp | Ile | Ala | Leu | Ala | Asn | Lys | Glu | Thr | Leu | Ile | Ala | Gly | |
| | | 195 | | | | | 200 | | | | | 205 | | | | |
| Gly | Pro | Phe | Val | Leu | Pro | Leu | Ala | Gln | Lys | His | Asn | Val | Lys | Ile | Leu | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| Pro | Ala | Asp | Ser | Glu | His | Ser | Ala | Ile | Phe | Gln | Cys | Ile | Gln | Gly | Leu | |
| | 225 | | | | 230 | | | | | 235 | | | | | 240 | |
| Pro | Glu | Gly | Ala | Leu | Arg | Arg | Val | Ile | Leu | Thr | Ala | Ser | Gly | Gly | Ala | |
| | | | | 245 | | | | | 250 | | | | | 255 | | |
| Phe | Arg | Asp | Trp | Pro | Val | Asp | Lys | Leu | Lys | Asp | Val | Lys | Val | Ala | Asp | |
| | | | 260 | | | | | 265 | | | | | 270 | | | |
| Ala | Leu | Lys | His | Pro | Asn | Trp | Asn | Met | Gly | Lys | Lys | Ile | Thr | Val | Asp | |
| | | 275 | | | | | 280 | | | | | 285 | | | | |
| Ser | Ala | Thr | Leu | Phe | Asn | Lys | Gly | Leu | Glu | Val | Ile | Glu | Ala | His | Tyr | |
| | 290 | | | | | 295 | | | | | 300 | | | | | |
| Leu | Phe | Gly | Ala | Asp | Tyr | Asp | His | Ile | Glu | Ile | Val | Ile | His | Pro | Gln | |
| | 305 | | | | 310 | | | | | 315 | | | | | 320 | |
| Ser | Ile | Ile | His | Ser | Met | Ile | Glu | Thr | Gln | Asp | Ser | Ser | Val | Leu | Ala | |
| | | | | 325 | | | | | 330 | | | | | 335 | | |
| Gln | Leu | Gly | Trp | Pro | Asp | Met | Arg | Leu | Pro | Ile | Leu | Tyr | Thr | Leu | Ser | |
| | | | 340 | | | | | 345 | | | | | 350 | | | |
| Trp | Pro | Asp | Arg | Ile | Tyr | Cys | Ser | Glu | Val | Thr | Trp | Pro | Arg | Leu | Asp | |
| | | 355 | | | | | 360 | | | | | 365 | | | | |
| Leu | Cys | Lys | Leu | Gly | Ser | Leu | Thr | Phe | Lys | Thr | Pro | Asp | Asn | Val | Lys | |
| | 370 | | | | | 375 | | | | | 380 | | | | | |
| Tyr | Pro | Ser | Met | Asn | Leu | Ala | Phe | Ser | Ala | Gly | Arg | Ala | Gly | Gly | Thr | |
| | 385 | | | | 390 | | | | | 395 | | | | | 400 | |
| Met | Thr | Gly | Val | Leu | Ser | Ala | Ala | Asn | Glu | Lys | Ala | Val | Glu | Met | Phe | |
| | | | | 405 | | | | | 410 | | | | | 415 | | |
| Ile | Asp | Glu | Lys | Ile | Ser | Tyr | Trp | Asn | Leu | Phe | Lys | Val | Val | Glu | Leu | |
| | | | 420 | | | | | 425 | | | | | 430 | | | |
| Thr | Cys | Glu | Lys | His | Gln | Asn | Glu | Leu | Val | Ser | Ser | Pro | Ser | Leu | Glu | |
| | | 435 | | | | | 440 | | | | | 445 | | | | |
| Glu | Ile | Ile | His | Tyr | Asp | Leu | Trp | Ala | Arg | Lys | Tyr | Ala | Ala | Ser | Leu | |
| | 450 | | | | | 455 | | | | | 460 | | | | | |
| Gln | Asp | Ser | Ser | Ser | Phe | Thr | Pro | Ile | Leu | Ala | | | | | | |
| | 465 | | | | 470 | | | | | 475 | | | | | | |

<210> 19
 <211> 1640

<212> DNA
<213> *Triticum aestivum*

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<210> 20
<211> 473
<212> PRT
<213> *Triticum aestivum*

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35 40 45
Cys Ser Met Gln Gln Gly Pro Pro Pro Ala Trp Pro Gly Arg Ala Val
50 55 60
Ala Glu Pro Glu Arg Arg Ser Trp Glu Gly Pro Lys Pro Ile Ser Ile
65 70 75 80
Val Gly Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu Asp Ile Val Ala
85 90 95
Glu Asn Pro Asp Lys Phe Arg Val Val Ala Leu Ala Ala Gly Ser Asn
100 105 110

| | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Thr | Leu | Leu | Ala | Asp | Gln | Val | Lys | Thr | Phe | Lys | Pro | Lys | Leu | Val | 115 | 120 | 125 |
| Ala | Val | Arg | Asn | Glu | Ser | Leu | Leu | Asn | Glu | Leu | Lys | Glu | Ala | Leu | Ala | 130 | 135 | 140 |
| Gly | Cys | Glu | Glu | Met | Pro | Glu | Ile | Ile | Pro | Gly | Glu | Gln | Gly | Val | Ile | 145 | 150 | 155 |
| Glu | Val | Ala | Arg | His | Pro | Asp | Ala | Val | Thr | Val | Val | Thr | Gly | Ile | Val | 165 | 170 | 175 |
| Gly | Cys | Ala | Gly | Leu | Lys | Pro | Thr | Val | Ala | Ala | Ile | Glu | Ala | Gly | Lys | 180 | 185 | 190 |
| Asp | Ile | Ala | Leu | Ala | Asn | Lys | Glu | Thr | Leu | Ile | Ala | Gly | Gly | Pro | Phe | 195 | 200 | 205 |
| Val | Leu | Pro | Leu | Ala | His | Lys | His | Asn | Val | Lys | Ile | Leu | Pro | Ala | Asp | 210 | 215 | 220 |
| Ser | Glu | His | Ser | Ala | Ile | Phe | Gln | Cys | Ile | Gln | Gly | Leu | Ser | Glu | Gly | 225 | 230 | 235 |
| Ser | Leu | Arg | Arg | Val | Ile | Leu | Thr | Ala | Ser | Gly | Gly | Ala | Phe | Arg | Asp | 245 | 250 | 255 |
| Trp | Pro | Val | Glu | Lys | Leu | Lys | Asp | Val | Lys | Val | Ala | Asp | Ala | Leu | Lys | 260 | 265 | 270 |
| His | Pro | Asn | Trp | Ser | Met | Gly | Lys | Lys | Ile | Thr | Val | Asp | Ser | Ala | Thr | 275 | 280 | 285 |
| Leu | Phe | Asn | Lys | Gly | Leu | Glu | Val | Ile | Glu | Ala | His | Tyr | Leu | Phe | Gly | 290 | 295 | 300 |
| Ala | Glu | Tyr | Asp | Asp | Ile | Glu | Ile | Val | Ile | His | Pro | Gln | Ser | Ile | Ile | 305 | 310 | 315 |
| His | Ser | Met | Ile | Glu | Thr | Gln | Asp | Ser | Ser | Val | Leu | Ala | Gln | Leu | Gly | 325 | 330 | 335 |
| Trp | Pro | Asp | Met | Arg | Leu | Pro | Ile | Leu | Tyr | Thr | Leu | Ser | Trp | Pro | Asp | 340 | 345 | 350 |
| Arg | Val | Tyr | Cys | Ser | Glu | Val | Thr | Trp | Pro | Arg | Leu | Asp | Leu | Cys | Lys | 355 | 360 | 365 |
| Leu | Gly | Ser | Leu | Thr | Phe | Lys | Ala | Pro | Asp | Asn | Val | Lys | Tyr | Pro | Ser | 370 | 375 | 380 |
| Val | Asp | Leu | Ala | Tyr | Ala | Ala | Gly | Arg | Ala | Gly | Gly | Thr | Met | Thr | Gly | 385 | 390 | 395 |
| Val | Leu | Ser | Ala | Ala | Asn | Glu | Lys | Ala | Val | Glu | Leu | Phe | Ile | Asp | Glu | 405 | 410 | 415 |
| Lys | Ile | Ser | Tyr | Leu | Asp | Ile | Phe | Lys | Val | Val | Glu | Met | Thr | Cys | Asp | 420 | 425 | 430 |

Ala His Arg Asn Glu Leu Val Thr Arg Pro Ser Leu Glu Glu Ile Ile
435 440 445

His Tyr Asp Gln Trp Ala Arg Lys Phe Ala Ala Asn Leu Gln Pro Ser
450 455 460

Ser Ser Gly Arg Ser Pro Val Leu Ala
465 470

<210> 21

<211> 406

<212> PRT

<213> Arabidopsis thaliana

<400> 21

Ala Pro Arg Gln Ser Trp Asp Gly Pro Lys Pro Ile Ser Ile Val Gly
1 5 10 15

Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu Asp Ile Val Ala Glu Asn
20 25 30

Pro Asp Lys Phe Arg Val Val Ala Leu Ala Ala Gly Ser Asn Val Thr
35 40 45

Leu Leu Ala Asp Gln Val Arg Arg Phe Lys Pro Ala Leu Val Ala Val
50 55 60

Arg Asn Glu Ser Leu Ile Asn Glu Leu Lys Glu Ala Leu Ala Asp Leu
65 70 75 80

Asp Tyr Lys Leu Glu Ile Ile Pro Gly Glu Gln Gly Val Ile Glu Val
85 90 95

Ala Arg His Pro Glu Ala Val Thr Val Val Thr Gly Ile Val Gly Cys
100 105 110

Ala Gly Leu Lys Pro Thr Val Ala Ala Ile Glu Ala Gly Lys Asp Ile
115 120 125

Ala Leu Ala Asn Lys Glu Thr Leu Ile Ala Gly Gly Pro Phe Val Leu
130 135 140

Pro Leu Ala Asn Lys His Asn Val Lys Ile Leu Pro Ala Asp Ser Glu
145 150 155 160

His Ser Ala Ile Phe Gln Cys Ile Gln Gly Leu Pro Glu Gly Ala Leu
165 170 175

Arg Lys Ile Ile Leu Thr Ala Ser Gly Gly Ala Phe Arg Asp Trp Pro
180 185 190

Val Glu Lys Leu Lys Glu Val Lys Val Ala Asp Ala Leu Lys His Pro
195 200 205

Asn Trp Asn Met Gly Lys Lys Ile Thr Val Asp Ser Ala Thr Leu Phe
210 215 220

Asn Lys Gly Leu Glu Val Ile Glu Ala His Tyr Leu Phe Gly Ala Glu
225 230 235 240

Tyr Asp Asp Ile Glu Ile Val Ile His Pro Gln Ser Ile Ile His Ser
 245 250 255
 Met Ile Glu Thr Gln Asp Ser Ser Val Leu Ala Gln Leu Gly Trp Pro
 260 265 270
 Asp Met Arg Leu Pro Ile Leu Tyr Thr Met Ser Trp Pro Asp Arg Val
 275 280 285
 Pro Cys Ser Glu Val Thr Trp Pro Arg Leu Asp Leu Cys Lys Leu Gly
 290 295 300
 Ser Leu Thr Phe Lys Lys Pro Asp Asn Val Lys Tyr Pro Ser Met Asp
 305 310 315 320
 Leu Ala Tyr Ala Ala Gly Arg Ala Gly Gly Thr Met Thr Gly Val Leu
 325 330 335
 Ser Ala Ala Asn Glu Lys Ala Val Glu Met Phe Ile Asp Glu Lys Ile
 340 345 350
 Ser Tyr Leu Asp Ile Phe Lys Val Val Glu Leu Thr Cys Asp Lys His
 355 360 365
 Arg Asn Glu Leu Val Thr Ser Pro Ser Leu Glu Glu Ile Val His Tyr
 370 375 380
 Asp Leu Trp Ala Arg Glu Tyr Ala Ala Asn Val Gln Leu Ser Ser Gly
 385 390 395 400
 Ala Arg Pro Val His Ala
 405

<210> 22
 <211> 475
 <212> PRT
 <213> Mentha x piperita

<400> 22
 Met Ala Leu Asn Leu Met Ala Pro Thr Glu Ile Lys Thr Leu Ser Phe
 1 5 10 15
 Leu Asp Ser Ser Lys Ser Asn Tyr Asn Leu Asn Pro Leu Lys Phe Gln
 20 25 30
 Gly Gly Phe Ala Phe Lys Arg Lys Asp Ser Arg Cys Thr Ala Ala Lys
 35 40 45
 Arg Val His Cys Ser Ala Gln Ser Gln Ser Pro Pro Pro Ala Trp Pro
 50 55 60
 Gly Arg Ala Phe Pro Glu Pro Gly Arg Met Thr Trp Glu Gly Pro Lys
 65 70 75 80
 Pro Ile Ser Val Ile Gly Ser Thr Gly Ser Ile Gly Thr Gln Thr Leu
 85 90 95
 Asp Ile Val Ala Glu Asn Pro Asp Lys Phe Arg Ile Val Ala Leu Ala
 100 105 110

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Ala | Gly | Ser | Asn | Val | Thr | Leu | Leu | Ala | Asp | Gln | Lys | Ala | Phe | Lys | Pro | | |
| | | 115 | | | | | 120 | | | | | 125 | | | | | |
| Lys | Leu | Val | Ser | Val | Lys | Asp | Glu | Ser | Leu | Ile | Ser | Glu | Leu | Lys | Glu | | |
| | 130 | | | | | 135 | | | | | 140 | | | | | | |
| Ala | Leu | Ala | Gly | Phe | Glu | Asp | Met | Pro | Glu | Ile | Ile | Pro | Gly | Glu | Gln | | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | | |
| Gly | Met | Ile | Glu | Val | Ala | Arg | His | Pro | Asp | Ala | Val | Thr | Val | Val | Thr | | |
| | | | | 165 | | | | | 170 | | | | | | 175 | | |
| Gly | Ile | Val | Gly | Cys | Ala | Gly | Leu | Lys | Pro | Thr | Val | Ala | Ala | Ile | Glu | | |
| | | | 180 | | | | | 185 | | | | | | 190 | | | |
| Ala | Gly | Lys | Asp | Ile | Ala | Leu | Ala | Asn | Lys | Glu | Thr | Leu | Ile | Ala | Gly | | |
| | | 195 | | | | | 200 | | | | | 205 | | | | | |
| Gly | Pro | Phe | Val | Leu | Pro | Leu | Ala | Lys | Lys | His | Asn | Val | Lys | Ile | Leu | | |
| | 210 | | | | | 215 | | | | | 220 | | | | | | |
| Pro | Ala | Asp | Ser | Glu | His | Ser | Ala | Ile | Phe | Gln | Cys | Ile | Gln | Gly | Leu | | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | | |
| Pro | Glu | Gly | Ala | Leu | Arg | Arg | Ile | Ile | Leu | Thr | Ala | Ser | Gly | Gly | Ala | | |
| | | | | 245 | | | | | 250 | | | | | 255 | | | |
| Phe | Arg | Asp | Leu | Pro | Val | Glu | Lys | Leu | Lys | Glu | Val | Lys | Val | Ala | Asp | | |
| | | | 260 | | | | | 265 | | | | | | 270 | | | |
| Ala | Leu | Lys | His | Ser | Asn | Trp | Asn | Met | Gly | Lys | Lys | Asn | Thr | Val | Arg | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | |
| Leu | Leu | Gln | Leu | Phe | Phe | Asn | Lys | Gly | Leu | Glu | Val | Ile | Lys | Ala | His | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | |
| Tyr | Leu | Phe | Gly | Ala | Glu | Tyr | Asp | Asp | Ile | Glu | Ile | Val | Ile | His | Ser | | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | | |
| Pro | Ser | Ile | Ile | His | Ser | Met | Val | Glu | Thr | Gln | Asp | Ser | Ser | Val | Leu | | |
| | | | | 325 | | | | | 330 | | | | | 335 | | | |
| Ala | Gln | Leu | Gly | Trp | Pro | Asp | Met | Arg | Leu | Pro | Ile | Leu | Tyr | Thr | Leu | | |
| | | | 340 | | | | 345 | | | | | | 350 | | | | |
| Ser | Trp | Pro | Glu | Arg | Val | Tyr | Cys | Ser | Glu | Ile | Thr | Trp | Pro | Arg | Leu | | |
| | | 355 | | | | | 360 | | | | | 365 | | | | | |
| Asp | Leu | Cys | Lys | Val | Asp | Leu | Pro | Phe | Lys | Lys | Pro | Asp | Asn | Arg | Glu | | |
| | 370 | | | | | 375 | | | | | 380 | | | | | | |
| Ile | Pro | Ala | Met | Asp | Leu | Ala | Tyr | Ala | Ala | Trp | Lys | Ser | Arg | Ser | Thr | | |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 | | |
| Met | Thr | Gly | Val | Leu | Ser | Ala | Ala | Asn | Glu | Lys | Ala | Val | Glu | Met | Phe | | |
| | | | | 405 | | | | | 410 | | | | | 415 | | | |
| Ile | Asp | Glu | Lys | Ile | Gly | Tyr | Leu | Asp | Ile | Phe | Lys | Val | Val | Glu | Leu | | |
| | | | 420 | | | | | 425 | | | | | | 430 | | | |

Thr Cys Asp Lys His Arg Ser Glu Met Ala Val Ser Pro Ser Leu Glu
435 440 445

Glu Ile Val His Tyr Asp Gln Trp Ala Arg Asp Tyr Ala Ala Thr Val
450 455 460

Leu Lys Ser Ala Gly Leu Ser Pro Ala Leu Val
465 470 475